bottom. This would consequently require and justify the participation (interference) including preemptive one, of other countries in the settlement of relations between the Caspian States themselves, on the one hand, and between the Caspian States and oil companies from third countries operation in this region, on the other hand. We shall, however leave this subject to the politologists as well, i.e. outside the scope of this work.

Thus the uneven distribution of oil and gas resources in the Caspian offshore provides an objective ground for differences in the definition of the legal status of the Caspian Sea (although the formal arguments of the parties involved may, of course, be quite different).

Depending on different scenarios of the Caspian's delimitation, the reserves of hydrocarbon resources of individual countries may also be very different. The price at stake is high, especially for Iran, Kazakhstan, and Russia. According to the estimates of the Russian Ministry of Natural Resources, under different scenarios of Caspian sea-bottom division in line with the five main fundamental approaches, the minimum and the maximum evaluations of oil and gas resources (provided the average densities of possible resources) for individual Caspian states would vary by (see Table 3):

- For Azerbaijan, by 7%,
- For Iran, by 147% (i.e. by 2.47 times),
- For Kazakhstan, by 117% (i.e. by 2.17 times),
- For Russia, by 110% (i.e. by 2.1 times),
- For Turkmenistan, by 21%.

And for the Caspian as a whole, by 19%.

Due to this effect, the ultimate decision will have the most significant impact on Russia and Kazakhstan. Table 3 shows that delimitation options preferred by individual Caspian states are quite different, so we can hardly expect an early and easy completion of negotiations on the legal status of the Caspian. In our opinion, however, the pending nature of legal issues (we will not discuss these here either) may only slow down but not arrest the development of oil and gas resources of the Caspian.

In order to define priorities in this issue that would be mutually acceptable for all Caspian countries, we need to clearly see the economic parameters of different options for the development of Caspian hydrocarbons and the main existing scenario limitations of the development of petroleum industry in the region.

5. Industrial Potential for the Production of Caspian Oil (First Stage of Development)

In order to analyze the industrial potential for the production of oil in the Caspian region, we prepared a schedule of possible oil production by individual countries for the next 20 years, i.e. for the period up to 2018 (See Fig. 3). The calculation methodology was based on an application of oil production curves at similar fields in other countries to Caspian projects proceeding from the existing evaluations of proved recoverable reserves of individual Caspian fields (which is equivalent to cumulative production for the full duration of project's development).

In our calculations for Azerbaijan (fig. 4) we used data for the first four projects out of nine for which exploration and production agreements have been signed with different oil companies as of day of

calculations (in brackets we showed the evaluations of their proved recoverable reserves of oil and condensate):

(1) Azeri-Chirag-Guneshli (520 million tons),

(2) Karabakh (85 million tons),

(3) Shah Deniz (300 million tons),

(4) Dan Ulduzu Ashrafi (140 million tons).

There are no stable evaluations of proved reserves for the other five projects yet, so these projects have not been included in the scope of this study at this stage, so the data for oil production in Azerbaijan is of necessity depressed (keeping in mind that some of the production not yet accounted for will go to meet domestic demand), as it presents the first stage of development of the oilfields on the country's Caspian shelf only.

Our forecast of possibilities for production in Kazakhstan (Fig. 5) is based on consolidated evaluations of liquid fuels production from Tengiz, Karachaganak and several smaller onshore fields (Kumkol, Uzen, etc.), those evaluations adjusted using data we obtained from various sources, and, starting from 2004, oil production on the Kazakhstan shelf of the Caspian is taking into account. In our opinion, the official forecasts of the Government of Kazakhstan concerning the levels of national oil production are somewhat exaggerated, so we decided not to use them for our forecasts.

Turkmenistan's absence in our estimates of oil supplies to the world market is explained by the fact that in the period under consideration the oil industry of the country will be primarily supplying oil to the domestic market (the country is currently experiencing a rather significant unmet pent-up domestic demand), so we shall proceed from the premise that within the time-frame under consideration Turkmenistan will not become an oil exporter.

Guided by the considerations set out at the very outset, in addition to the Caspian States, we also included in our investigation some new oil and gas projects in Russia, in particular those that will be clearly oil-export orientated and will be in competition with Caspian oil, as well as a forecast of production growth in Iraq in the case that UN sanctions are lifted.

In the case of Russia, it will include the development projects in the Timan-Pechora oil and gas province and projects on the Sakhalin shelf (Fig. 6). The calculations take into account the Timan-Pechora Company (TPC) project (11 fields – Titov, Trebs, etc.) and two Sakhalin projects already under development: Sakhalin 1 (Chaivo, Odoptu and Arkutun-Dagi fields) and Sakhalin 2 (Piltun-Astokhskoye and Lunskoye fields). All those fields will be developed in parallel with the Caspian ones and will be orientated at the same markets (Timan-Pechora at the Western European market, and the Sakhalin projects at the Asian markets), competing with Caspian oil. At this stage of our investigation we ignored potential supplies from other Timan-Pechora export-orientated projects currently at various stages of preparation (Northern Territories, Central Khoreyverskaya Depression, etc.), so the evaluations of competing supplies of liquid fuels from the Timan-Pechora region and the Sakhalin shelf are depressed thus expanding the potential zone of demand for Caspian oil. In reality this zone will be more narrow than that resulting from our calculations

The proposed oil supplies from Iraq after 2000 (Table 5) are borrowed from a forecast made by the Paris-based Arab Petroleum Research Center [18]. The 2000 evaluation is based on the premise that even if the UN sanctions have been lifted by that time, this will not have had any significant

impact on production levels yet. Therefore, in evaluating the Iraqi export in 2000 we proceeded from the current annual production level of around 40 million tons (after the upward adjustment of Iraq's national production cap within the UN's "crude for food" program). The supplies to the Mediterranean are limited by the capacity of the Kirkuk-Ceyhan pipeline (about 80 million tons per year). It should be noted that this forecast is quite optimistic for Iraq, while the actual situation after the sanctions are lifted will depend on whether the country succeeds in attracting the needed investments for its petroleum complex. Besides, the routing of the Kirkuk-Ceyhan pipeline through territories under control of the Kurdish guerillas complicates the problems of security of supplies.

The calculations show that early in the next century Azerbaijan alone, just within the first phase of development of its Caspian fields, is capable of producing 60-70 million tons of crude per year. Oil industry in Kazakhstan may produce even more than that. Thus around 2005 the incremental production in the region could exceed 100 million tons (as we are discussing, for the time being, this figure reflects just the potential production capacity of the Caspian without talking into account any limitations imposed by the throughput capacities of export pipelines). In the future the level of Caspian production will be determined by the pace of development of Kazakhstan's shelf (see Fig. 5). If the pace of development is at its fastest, the production of Caspian oil may reach almost 200 million tons by the year 2010 and remain at that level for some time (see Fig. 3). The main "technological" limitations (i.e. those that can be overcome, with the question being the costs and the time-frames) are the absence of any routes of delivery of the crude produced to the markets, the potential negative impact of Caspian oil development on the environment (e.g. the potential threat to the unique Caspian sturgeon and high seismic risk, especially in the case of underwater pipelines in the Southern Caspian), and a number of other limitations.

Thus the "technologically possible" level of Caspian crude production is quite substantial. Two questions arise naturally, having to do with the two main "economic" limitations on the path toward the Caspian emerging as a new oil-producing province:

(a) Whether the market will require such volumes of oil supplies from this region (is there a limitation of demand for Caspian oil); and

(b) Whether the projects of development and transportation of Caspian oil may be supported by the appropriate levels of necessary investments (is there an investment supply limitation for the development of Caspian oil).

6. Prospects for Changing Demand in Europe and Asia

Today, there are two main markets for liquid fuels in the Eastern Hemisphere, where the Caspian oil is to be supplied: Asia and Pacific, and Western Europe, each consuming approximately the same amount of oil (accordingly, 800 million and 750 million tons in 1995). Early in the next century, the demand for oil in the world in general and in the above regions in particular will be characterized by a stable growth, with Asian fuel consumption growth remaining especially dynamic. In accordance with the estimates of the International Energy Agency (IEA) [19], by 2010 (when the discovered Caspian fields may achieve their production peak), the incremental growth of annual consumption of liquid fuel in Europe may achieve about 80 million tons and over 500 million tons compared to 1995 in Asia (see Table 4). Taking into account the dwindling production at the currently operating fields in the above regions, the net increase of demand for oil (consumption

increase plus compensation of decrease of own production in the region) will be even more significant, especially in Europe. The peak production in the North Sea will be achieved in around 2000, after which the production will start declining. By 2010 this decline may provide an increased demand for yet another 80 million tons. Thus the total incremental demand in Europe may by that time reach around 160 million tons per year (table 4). Similarly, the domestic production in Asia (without the Caspian) may fall in 1995-2010 by around 40 million tons, increasing by that amount the oil demand growth in the region driving the total incremental net demand to almost 600 million tons by 2010. Thereafter the above-mentioned gap between the regions will expand even further.

As a result, the net increase in the demand for oil in Asia by 2015 will exceed that in Western Europe by 3.3 times (almost 800 million tons against 240 million tons). The changing demand is especially well illustrated by Fig. 7.

Over 50 per cent of the net demand for oil in Western Europe after 2010 will be accounted for by the need to replace the depleting crude supplies from the North Sea (i.e. the replacement of the well established oil flows with their characteristics – gravity, sulphur content and the like – at the existing refineries), whereas 95 percent of the growing demand in Asia will be caused by increased consumption (i.e. will require new refining capacities for new oil flows). So almost all of incremental imports to Asian market will be processed at new refineries, which could be tuned in advance to accommodate Caspian types of crude (that is because these refineries do not exist yet and will be built over the next years as demand grows). In Europe, by contrast, the existing refining facilities have a surplus capacity totaling from 100 million to 120 million tons a year. Thus either many existing plants in operation will have to be refurbished to replace traditional sorts with lighter and sweeter Caspian oil (if the latter will win its competition with traditional supplies), or, which is more likely, Caspian oil will find its way to existing but idle refineries with a most appropriate structure that best suits the quality of this new oil and at no additional costs of their upgrading.

7. Forecast Balance of Supply and Demand for Caspian Oil: Main Scenarios

What is the correlation between the level of demand growth and the possible scale of export of the Caspian crude? Today the main requirements of the two markets under consideration are met by the supplies of oil from the Middle East. Therefore, oil from the Caspian region will be emerging on the world market: (1) in a situation of the existing surplus production capacity in the Middle East, now about 300 million tons per year [38], which exceeds all production forecasts for Caspian oil; and (2) simultaneously with the implementation of new projects in the Russian oil industry. As was noted previously, Russia, the Middle East and the Caspian will be making their impact simultaneously on the established directions of flows and balance of powers in the oil markets of the Eastern Hemisphere (see [20]).

Let us consider two main scenarios of Caspian oil supplies: "Western" and "Eastern" ones (see Tables 5.1 and 5.2):

Scenario One ("Western", Table 5.1*)* presupposes that the main flow of oil from the Caspian will be aimed at Europe.

We shall proceed from the assumption that the CPC (Caspian Pipeline Consortium) project for the export of crude from Kazakhstan (oil from Tengiz field and others) is implemented, and the construction of the Baku-Ceyhan pipeline with a capacity of 40 million tons per year for the export

of Azerbaijani crude has been completed. What will be the potential supplies of oil to the world markets in this case?

The volume of supplies from Kazakhstan will evidently be limited to the design capacity of the CPC: 28 million tons after the implementation of Phase One of the project with subsequent capacity increase up to 67 million tons by about 2015. In order to fill that capacity fully and to achieve the most economical transportation mode, there is a need to commission fields equal to another Tengiz (supplies of oil from Tengiz and of condensate from Karachaganak will amount in 2005 to just 50 percent of the CPC capacity, 63 percent in 2010, and 45 percent in 2015.

Even now, Azerbaijan may use the Baku-Novorossiisk pipeline with an annual capacity of 17 million tons (with the proposed enhancement to 25 million tons, and, starting from late 1998 (or, more probably, somewhat later), the Baku-Supsa pipeline with a capacity of 7 million tons per annum. The pipe to Ceyhan will add yet another 40 million tons, capping Azerbaijan's crude export capacity at 64 million tons per year. The expansion to that level seems quite probable, as the supplies of oil resulting from the first Azerbaijani Caspian project (AIOC's "project of the century" in the Azeri, Chirag and Guneshli fields) should bet at 35 to 40 million tons per annum by the year 2005. The second group of projects, Karabakh, Shah-Deniz, and Dan-Ulduz/Asharafi fields, may add another 20-25 million tons per annum, keeping in mind that Azerbaijan has signed nine agreements with consortia of foreign companies on exploration and production of oil and gas, the five latest of those (Lenkoran-Talysh Deniz, Apsheron, Nakhychvan, Oguz and D-222) have not been taken into account in the forecasts in Tables 3 and 5.

Iraqi oil production will play an important part in the oil market situation. Sooner or later, economic sanctions on Iraq will be lifted, and one of the cheapest (in terms of production costs) crudes in the world will start flowing freely to the world markets. According to the estimates of the Arab Petroleum Research Center in Paris, as early as two or three years after the sanctions have been lifted, Iraq will be able to produce about 120 million tons per annum, and by 2010 the production will leap to 300 million tons [18]. The existing production infrastructure available today is not sufficient for "digesting" such a volume of crude (the current capacities can only export a total of 80 million tons per year toward the West); however, considering the lucrative economics of Iraqi oil projects, the investment needed to finance the entire production will most likely be provided.

The Timan-Pechora basin with its quite evident orientation at North Western Europe may supply over 40 million tons by the year 2010.

Let us do some summing up. The year is 2000. Incremental demand growth in Europe is 30 million tons. The supply side: Kazakhstan's export will remain at the current level (5 million tones under the quota allocated to that country in the Russian pipeline system), i.e. the CTC project, or any other project for that matter, will not have been implemented yet by that time. Azerbaijan will not be able to supply much more than 10 million tons, and the exports from Iraq will most likely remain at the current level of about 40 million tons, even if the sanctions are lifted by that time (taking into account the recent UN-authorized increase of oil exports from Iraq within the "oil for food" program), Timan-Pechora will clearly start producing after 2000. The aggregate increase of supplies to the European market will total almost 60 million tons, i.e. almost double the net increase of demand – and that assuming that the supplies from the "traditional" sources (North Africa and the Middle and Near East) will remain at the current levels. Hence, even in 2000 the assumption of an available segment for Caspian oil at Western European markets is not supported

by any calculations, so, from the very outset of its penetration of that market the Caspian oil will have to literally "fight its way" squeezing out the traditional suppliers

By 2005, the annual demand for oil in Europe will increase by 54 million tons or, taking into account the dwindling production in the North Sea, by 84 million tons. By that time, Kazakhstan will in all probability be able to offer 28 million tons from Stage One of the CTC, Azerbaijan's first group of fields will be at its peak production (over 40 million tons taking into consideration the domestic consumption), Iraq will export 120 million tons (assuming the sanctions will have been removed by that time), half of which may be supplied to Europe (assuming the availability of transportation capacities). Another 18 million tons may be provided by Timan-Pechora. All of the above taken together will supply around 150 million tons of incremental oil to the European markets, and it looks like almost half of this supply will not find ready buyers, which is more than enough to collapse the market, not to mention the OPEC oil.

By 2010, the incremental demand will total 160 million tons, with the supply exceeding that growth by almost 1.5 times, resulting in an even more destructive effect on the oil market than in 2005, which leads us to the conclusion that supplying oil to the European market alone will inevitably collapse that market. Considering the global nature of the world market of oil and the interrelations between the prices at individual segments of the market through the world-spanning system of commodity exchange trade in crude, we can only emphasize the inevitability in that case of another round of events similar to those of the "anti-crisis" of 1986.

Keeping in mind the fact that costs related to production and export of oil in Russia are higher than those in the Caspian and in Iraq, it is quite possible that in this scenario Russian oil will be squeezed out of the world market or, alternatively, Russian oil exports may become a loosing proposition. Some of Russia's losses in this case may be set off by a massive involvement of Russian companies in Caspian and Middle Eastern hydrocarbon development projects (at least, a number of Russian companies, as was already mentioned, have already stated their desire to expand their operations in the region, pushed further by a set of objective reasons [20], as well as by good potential income from the transit of Kazakhstan's oil through the CTC (assuming a tariff of $15, the transit of 28 million tons per year would yield $420 million per annum; 67 million tons, $1 billion per annum). On the whole, developments in this direction will provide an extra incentive for the Russian companies to move their operations abroad in order to cut costs and boost their competitiveness. The unfavorable global market situation may be allayed somewhat in the case of a marked economic upturn and the resulting growth of demand for oil and petroleum products within the country making domestic operations more attractive.

A collapse of the market as a result of supplies of Caspian oil may be avoided by two methods, the first being introducing controls of production volumes. Considering, however, the lack of realistic enforcement mechanisms for such controls (the 40 years of OPEC's existence is a good case in point), on the one hand, and the fact that oil exports are in reality the sole proposed source of raising the well-being of the Caspian States, this option can hardly be regarded as realistic.

The second method is try and find a way to allocate the oil flows from the Caspian, Russia and Iraq between the European and Asian markets in order not to provoke excessive gaps between supply and demand at individual regional markets. We need to keep in mind, however, that some of the fields under development are quite rigidly tied to certain markets (e. g., Timan-Pechora is tied to North Western Europe while the Sakhalin projects are tied to Asia and the Pacific). Despite the fact that oil from Azerbaijan can in principle be supplied Eastward, in reality it will be sent exclusively to

the European markets. In fact, of all countries under consideration, it is only Iraq and Kazakhstan that have a certain leeway in choosing the directions of their petroleum exports. It is quite evident that the scenario in which most oil from Iraq is sent to Asian consumers in South and South East Asia would be the best one. Just how realistic it is to expect such a reorientation is of course quite a different matter in view of the fact that Iraqi oil was traditionally supplied to the Mediterranean. Besides, it is quite possible that the actual volume of Iraqi exports will be much more modest due to investment limitations.

A possible version of the "Western" scenario, in which the overhang of supply over demand at the Western European market will be less than that stipulated in Table 5.1 may be the situation when some of the oil sent to the Mediterranean is transshipped to other markets, primarily those enjoying a fast growth (e.g. in Latin America). This scenario, however, would require additional calculations both of the growing supply and demand at growing markets beyond Eurasia, as well as a study of comparative costs of production and transportation of Caspian oil to those markets, which is a task for the next stage of this study.

The situation emerging in the Asian market is fundamentally different from that in Europe: given the same remaining conditions, i.e. without taking into account any OPEC supplies, Asia will be experiencing a growing shortage of supply which may exceed the reserve production capacity of OPEC by 2015. It means that Asia will remain the principal market for the production from the new petroleum projects.

Scenario Two (Eastern, Table 5.2) assumes that some of the Caspian oil will be sent to Asia. In that case, 20 to 50 million tons of crude from Kazakhstan and other Central Asian States will be channeled eastward, which would naturally prop up the European market.

Due to their geographic locations, the target markets of oil supplies from a number of Russian projects (Timan-Pechora, Sakhalin) are quite predetermined. All of Azerbaijan's oil will also be sent to the European market, just like in the "Western" scenario.

Kazakhstan: exports to the West would remain at their current level of 5 million tons per year, the CTC Project would not be implemented (unceasing procrastinations with the advancement of that project and zealous lobbying of the parties interested in the Baku-Ceyhan route which, as we will show below, is a competitive route of transportation of the Caspian oil to the exclusion of the CTC, and the pilot supplies of Tengiz oil to China by railroad, etc., give us a reason to consider this scenario as well) while all of the growth will happen in the "Eastern" direction, to China, within the framework of a pipeline project with the Chinese National Pipeline Company (CNPC), with the volume of supplies being determined by the pipeline's announced capacity of 20 million tons per year.

The data in Table 5.2 show that the implementation the "Eastern" scenario does not introduce any drastic changes to the situation on the oil market: the excessive supplies to the European market persist anyway, although at a slightly lower level as compared to the "Western" scenario.

The issue, however, is how realistic the "Eastern" scenario is. There are numerous economic (East) and political (South) obstacles in the construction of Southbound and Eastbound pipelines.

The Eastern option is less attractive for the simple reason that, as we will show below, the purely pipeline-based exports of oil from the Caspian to Asia would require vastly increased transportation costs. Thus the cost of production plus transportation (c.i.f. price) per ton of oil for the consumer would be substantially higher. There will be problems with finding financing, as transcontinental

projects of hydrocarbon transportation from the Caspian would require enormous investments, which, considering the political situation in the region (the risks are high and many) would greatly increase the cost of borrowing. Therefore, under this scenario, the "financial" costs of its implementation (including the cost of capital investment) could add considerably to its "technical" costs (without the cost of attracting investments).

If a mixed transportation scheme is implemented (Caspian oil delivered via the shortest route to the terminals in the Persian Gulf and tankered on to Asia), the economics of the "Eastern" scenario will be markedly better than the transcontinental pipeline option. In this case, the key to resolving the problem of building southbound transit pipelines from the Caspian will lie in constructive political settlements between the US and Iraq and the UN and Iraq. Today this possibility seems quite unrealistic in practice. The question is whether this political settlement can be achieved in the foreseeable future before fundamental decisions on the routes of transportation of Caspian oil are made.

Third Scenario (Table 5.3) is the only one that is theoretically most favorable to the exporters (in terms of balancing the demand and supply of Caspian oil) but it is quite unrealistic in practice, so it can only be of academic interest.

Fourth scenario (Table 5.4) shows the possible ways of allaying the situation on the European market if the Caspian oil is supplied mainly to Europe. The data in this Table indicate that in the case of a robust economic growth in the countries of the Black Sea and Central Europe, the currently forecast overhang of supply of the Caspian oil may be substantially reduced or even zeroed down. More calculations are needed to obtain more stable results in this scenario, but the main conclusion is quite evident – it is this version of the "Western" scenario only that can save the market from imminent collapse at the very outset of massive supplies of Caspian oil to Europe.

Shifting the brunt of consumption of the Caspian oil to Central Europe would predetermine a shift in priorities in choosing the main transportation routes. In this case:

- There will emerge additional arguments in favor of pipeline routes getting Caspian oil to the terminals on the East Coast of the Black Sea for loading it on to tankers and delivering it to the terminals on the West Coast for the purpose of its integration into the oil supply system of Central Europe (that is to be modernized and expanded at a later stage);
- The problem of Black Sea Straits (the Bosphorus and the Dardanelles, shipping, environment, etc) will be practically dropped from the agenda;
- The implementation of infrastructure projects related to the transportation of Caspian oil would serve as a powerful additional boost to the economic development of the Black Sea States of Central Europe which in tits turn would result in more growth of energy and oil consumption thus absorbing the Caspian oil that would otherwise create a surplus at the European market (for reference, according to the estimate made by the experts of KEPS RAS, the multiplier effect for pipeline projects as calculated on the basis of the CTC, i.e. for the Russian environment, is 2.15 [21]; so for Central Europe pipeline projects, the multiplier effect value will be no lower than this at the very least).

8. Costs of Production of Caspian Oil

In order to evaluate the economic effectiveness of Caspian projects as compared to other countries, we need first of all to estimate the approximate costs of production per ton of oil in this area. A comparative and a more detailed evaluation of oil production costs at new fields in different countries made by Thomas Stauffer [22] is shown in Fig. 8-1.

Other sources provide evaluations of crude production costs at the fields under development that are higher than those of Stauffer (without, however, specifying the methodology of the calculations), according to which the costs in the MNE countries are about $10-15 per ton; in other OPEC countries, $20-35 per ton, and in the North Sea, $45-70 per ton [23].

According to the French Petroleum Institute, in 1985-1995, the costs of oil production in the MNE states remained at a level of $15-30 per ton, and in other OPEC countries, $30-45 per ton. According to FPI, the costs of producing liquid fuels from bituminous sands, methods involving increased oil recovery and deep-see offshore production involved costs of $150-175 per ton, which can be reduced to $75-120 per ton in 10 years. The costs of production in Alaska and the North Sea in 1985 were $90-150, and in 1995, $60-75 per ton [24]. None of these sources, however, cite any costs for the Caspian oil.

The only source known to us that provides the fullest possible generalization of data for certain economic indicators of the development of individual Caspian projects in the Azerbaijan and Kazakhstan sectors is the above-mentioned report of the IEA [13]. It contains, however, just approximate specific investments per unit of "peak capacity" (i.e., the maximum production) for main oil and gas projects that are, in the case of Azerbaijan's fields, $535,000-625,000 per ton per year ($10,700-12,500 per barrel per day; and in Kazakhstan's fields, $600,000-715,000 per ton per year ($12,000-14,300 per barrel per day) of production capacity for the periods of maximum production (Table 6). The costs of oil production in the Caspian fields are not calculated in the IEA report.

The IEA data on specific investments in the production of Caspian oil, however, provide us with the opportunity to compare them with similar data for other oil producing countries, in particular, with the calculations of the London Centre of Global Energy Studies for OPEC countries (see Fig. 9). The data in that Figure show that the specific investments per barrel of incremental output per day (or per ton per year) at peak capacity (i.e. during maximum production periods) in the Caspian are basically comparable to similar OPEC indicators: those average investments in the Caspian are 2.5 times higher than the similar average for six main OPEC oil producers but are just 35% higher than the similar average for the remaining OPEC countries. The above-mentioned specific investments in Azerbaijan and Kazakhstan are about the same as those in Nigeria, Indonesia and Algeria (Fig.9).

Thus the statistics of the estimated costs of oil production in the Caspian fields are still lacking, so we shall make an attempt to evaluate their approximate level for this region ourselves. For this purpose we will use the following methodology: data on the investments needed for individual projects are normally found in periodicals, so we shall proceed from a 1:2 correlation between the capital and operational costs for the full term of development of the field, in a manner similar to that applied by us to other modern offshore projects (e.g. for Sakhalin 2 [25]). In this way we will be able to make an aggregate costs for the entire term of operation of the field. Spreading the values of aggregate costs thus obtained by years (assuming that the term of operation is 30 years) and discounting them at a rate of 10 percent we obtained the following results:

The estimated production costs are:

- $19 per ton for Azerbaijan (based on the data for Azeri-Chirag-Guneshli fields: the investment in the project is estimated at $8billion; Shah Deniz, $4 billion; Karabakh, $2 billion, and Dan Ulduzu-Ashrafi, $1.5 billion);
- $27 per ton for Kazakhstan (based on the data for Tengiz, $20 billion; and Karachaganak, $8 billion).

For comparison, the production costs in the Timan Pechora Company project are estimated at about $40 per ton (the investment in the Timan Pechora Company project is estimated at $15 billion).

In our analysis, we ignored the time spread of commissioning various fields, as for the purposes of our evaluation (preliminary estimate of production costs) the 1 to 2 years periods between commissioning different fields will not have any pronounced effect. In the future, changes in the costs of production will be determined by the direction of the thrust of two opposite vectors:

On the one hand, we should probably expect an increase in the estimate of aggregate capital investments for project implementation as its pre-development preparation proceeds up to the time of implementation (cost estimates normally tend to increase as project preparation proceeds – there are both the above-mentioned tendency to exaggerate reserve evaluations at the initial stages of a project, and the tendency at the same stages to diminish investments needed to develop it, in order to enhance its attractiveness to investors but also explained by the objective impossibility to foresee all risks and difficulties of the implementation of the project. This trend as applied to some Caspian projects in oil production and transportation can be seen very clearly in the data in Table 7. The data in that table are not sufficient to identify the rate of increase of investment evaluations with time (at the stage of pre-project preparation) but at the same time, in our opinion, are more than enough t prove that such a trend in fact exists.

On the other hand, thanks to the scientific and technological developments, production costs within individual projects will consistently decrease with time (thus, according to the data contained in [3], the average world costs of oil production decreased by 3.5 times in the period from early 1980s to mid-1990s; a detailed analysis of factors of this decrease can be seen in [24]), so the total aggregate operational costs for the duration of the project will be somewhat lower than that assumed in the calculations, as it will have a downward annual trend for the entire duration of the project.

Thus the approximate calculations of oil production costs in the Caspian shows that if we take the data provided by T. Stauffer [22] as the basis, then in that regard the Caspian States are substantially inferior to all MNE OPEC countries except for the UAE, and are in fact at the UAE onshore level or non-MNE OPEC level but at the same time have lower costs on the f.o.b. basis than the new Russian projects (see Fig.8-2). It is clear, however, that the production cost estimates do not answer the main question determining competitiveness of the Caspian oil: will it be cheaper or more expensive than the competing brands on c.i.f. basis, i.e. for the consumer. To answer that question we need to calculate and factor in the transportation component of the costs.

The evaluation of transportation costs will help us find out whether it will be possible to supply Caspian oil to the most promising Caspian markets or the restrictions of pipeline economics of the Caspian oil will only allow to move it westward.

9. Costs of Transportation of Caspian Oil by Directions of Supplies

The economic evaluation of various possible transportation routes of Caspian oil should be done on two planes:

(a) Evaluating the possible costs of delivery of a ton of oil to a given market in order to find out the total production and transportation costs for the consumer (the structure of c.i.f. price) within different transportation schemes;

(b) Evaluating the demand for investments needed to implement the individual transportation schemes in order to determine the total aggregate requirements for investments in the production and the delivery of the Caspian oil to individual markets.

To the best of our knowledge, there have been no consolidated evaluations of comparative economic indicators of the transportation of Caspian oil by all possible routes or, alternatively, such evaluations have not been published. The press normally publishes just evaluations of certain characteristics of the main pipeline construction projects for the transportation of Caspian oil. In the meanwhile, experts from Transneft have made detailed economic calculations of the costs of transportation of the Azerbaijan (see Table 8-1) and Kazakhstan (see Table 8-2) oil to the Western European market along 10 different transportation routes (c.i.f. Genoa or Rotterdam) as well as by different pipeline capacity options.

These evaluations for the Azerbaijani oil (Table 8-1) show a clear advantage, by far, of the Baku-Novorossiisk route in its two versions: through Chechnya (100/100) or bypassing it (154/101), then the two versions of the Baku-Supsa route: across the Bosphorus (192/104) or bypassing the Bosphorus with a pipeline through Burgas-Alexandropolis (241/136). Then, with an even wider gap, we see the third route Baku-Supsa and then on to Odessa-Brody-Omyshal (311/226). The last in line, significantly in the rear, are the two "Turkish" routes to the terminal in Ceyhan: the direct Baku-Ceyhan line (491/167) and the one through Supsa and Samsun on to Ceyhan (484/184). With increased pipeline capacity, the "Turkish" and the "Ukrainian" route swap their "last" and the "penultimate" places in this rating. (The figures in brackets show the percentage of the cost of the "cheapest" route. Transpiration costs at other routes include the costs of pumping through pipelines and marine shipping as well as loading/unloading and port fees. The first figure shows the cost at a capacity of 5 million tons per year, and the second figure shows the estimate for 30million tons per year.)

The calculations of tariffs for the transportation of oil from Kazakhstan, made by Transneft Company, show (Table 8-2) that at any pipeline capacity level in the scenarios under consideration, the most economic one is the CTC option followed by a range of options involving supplies of Kazakhstani oil to Samara and on through the system of Russian pipelines to Rotterdam, and wound up by a set of routes envisaging the deliveries of Kazakhstani oil from Tengiz through a Trans-Caspian Aktau-Baku pipeline and then on along the "Georgian" (through Supsa) or "Turkish" (through Ceyhan) route. Provided equal other conditions, the CTC route is 1.5 and more times more economic than the alternative routes involving a "Trans-Caspian", "Georgian" and/or "Turkish" leg.

US sources (e.g. US EIA) do not provide any equally detailed calculations based on which one could lobby the objective advantages of individual transportation routes of Caspian oil. Or, as we

will show further, they provide data (e.g. the IPP of Rice University [9] indicating an economic failure of arguments in favor of routes most actively championed by the US side. Moreover, data provided y the US EIA (see Table 9), the basic cost values related to some Russian routes are quite evidently incorrectly exaggerated. Thus, if we compare data on the investment in repairing the existing Baku-Novorossiisk pipeline (across Chechnya) quoted by the Russian Transneft ($98 million, Table 8-1), and those provided by the US EIA ($2.4 billion to repair just the Chechen portion of the pipe, Table 9), we will see that the exaggeration is as high as by 25 times! Even if we assume that the Transneft data are way too low, it cannot possibly be off the mark by 25 times, can it? Considering the fact that the report of the US EIA containing Table 9 [8] has been posted on the Internet, the number of persons misled by that bad-faith data should be staggering. This creates the strongest possible negative effect needed to form a distorted view of comparative economic advantages or disadvantages of individual transportation routes.

If we look at the other frequently quoted information sources, the discrepancies in the data on the cost of construction of main transportation routes for Azerbaijani oil will only increase. Suffice it to compare the data of Transneft (Table 8) and the US EIA (Table 9) with the data in Table 10 published by the Russian Petroleum Investor with an indirect reference to the results of a preliminary AIOC study saying that the price tag on the Baku-Ceyhan pipeline is $3-3.3 billion, Baku-Novorossiisk, $2.3 (?) billion, and Baku-Supsa, $1.2 billion (no mentioning of capacity figures for any of the routes).

The consolidated results of cost estimates related to the transportation of Caspian oil to European and Asian markets are presented in Table 11. The economic estimates for the transportation of Azerbaijani and Kazakhstani oil to the Western European market (c.i.f. Genoa and/or Rotterdam) in line with the "Western" scenario of this study (see Table 5-1) were prepared by the Transneft company (see Table 8), examined by the World Bank and at various highly representative international conferences. Calculations for other routes envisaging, inter alia, the delivery of Caspian oil to Asian markets using the eastern route (transcontinental pipelines) or the southern route (pipelines to the Persian Gulf area and then on by tankers to Asia) were prepared by the authors based on Transneft methodology.

The results of the calculations lead to the following conclusions: the Baku-Novorossiisk route remains economically the best for Azerbaijani oil, with the worst option being the Baku-Ceyhan route – and that is true for ANY equal capacities of pipelines under comparison. The Turkish route is worse than the pipeline portion of both the Novorossiisk and Supsa routes, whether the further transportation of oil from these two Black Sea port is done by sea via the Bosphorus and the Dardanelles or bypassing the straits using an additional bypass pipeline through Burgas and Alexandropolis. This is true even considering the fact that an investment estimate of $3.3 billion was used to calculate the Baku-Ceyhan cost of transportation (see Table 8), and not the estimate of $4.5 billion needed for the construction that we have been seeing more and more often lately in international press (See Table 7).

If we were to calculate the economics of transporting the Caspian crude along the Baku-Ceyhan route using the $4.5 billion investment estimate, the economic disadvantages of that route would become even more evident.

Moreover, the Transneft estimates demonstrate that the Baku-Ceyhan pipeline does not fit at all within the "multiple transportation routes (multiple pipelines). The concept is actively promoted by Western countries as well as by Caspian states themselves (primarily by Azerbaijan) on the

grounds of both economic considerations (the need to diversify transpiration routes) and reducing the dependence on the existing or proposed pipeline systems within Russia. The reality of the situation, however, is that the Baku-Ceyhan-Genoa route is worse, as was pointed out above, than any other Western routes of transportation of Azerbaijani oil to the markets at any pipeline capacity. The disadvantage is the least in terms of the cost of delivery of one ton of oil to Western Europe with the maximum capacity of the Baku-Ceyhan pipe, i.e. 30 million tons per year. The loss in the cost of transportation to Genoa (higher transportation costs as compared to cheaper alternative routes through the Bosphorus and the Dardanelles by around $20 per ton as compared to the routes to Novorossiisk and Supsa – see Table 8) could be regarded as payment for resolving the problem of safe passage through the straits and the related environmental problems, as the Ceyhan pipe bypasses the straits, which is promoted as one of its main advantages (see Table 10), if only there were no other options for bypassing the straits in delivering the oil from Baku through Novorossiisk or Supsa. There is an alternative, however: the Burgas-Alexandropolis bypass pipeline with a design capacity up to 40 million tons per annum.

When this bypass line is used, all of the three main routes under discussion for the delivery of Azerbaijani oil to Western European markets would bypass the Bosphorus-Dardanelles. The transportation costs for supplying crude from Baku to Genoa would be:

- $52 per ton through Ceyhan;
- $42 per ton through Supsa;
- $39 per ton through Novorossiisk (see Table 8-1).

Thus the only possible economic "advantage" of the Ceyhan route is in fact nonexistent in our opinion, which would suggest that any lobbying of this more expensive Ceyhan route as the main option for delivering Azerbaijani oil to the Western European markets is motivated by considerations of a purely political nature.

Besides, we should note in passing that the estimates of comparative economics of individual routes of transportation of Azerbaijani oil as presented in [9] also show that the Baku Ceyhan is the least economically acceptable as compared either to the Baku-Supsa pipeline or to the complex of Baku-Supsa/Samsun-Ceyhan pipelines. The proportionate costs of pipeline transportation along these routes (leaving aside the issue of their absolute values and assuming the Baku-Ceyhan costs at 100 percent) at the same capacities would be 100:28 and 100:78, accordingly (see Table 12).

There are, however, certain economic considerations that are implicitly present in the rationale for choosing the most expensive route as the "main" one. The principal lobbyists of that route are interested governments rather than companies involved in the development of the Caspian oil. Whereas the production companies involved are interested in implementing the most efficient and effective project (based on the costs to yield ratio and seek to maximize the net discounted positive cash flow), the transit state governments seek to implement the most expensive project possible. The more expensive the project, the more attractive it is for the host country, as the economic multiplier mechanism (simply the ratio of indirect effects to investments initiating these effects), the value of which for petroleum projects in different countries fluctuates from 1.6 to 2.4 [21, 26, 27], promises to create more jobs for the local populations as well as more direct and indirect tax and related revenue to the budget (e.g. customs duties on imported equipment and materials), and so on. This is the reason for the current drift in Azerbaijan's policy toward the concept of a "non-profit"

(for investors) main pipeline, which would allow the implementation of the more expensive project [28].

It is not the governments, however, but the investing oil companies that will have to pay extra for this kind of political choice. Will the management of Western oil companies be able to explain to their shareholders the reasons for their choice of the least economic route (if such decision is ultimately made) involving more costs and less or even no profits, hence less or even no dividends – remains a big question. In essence, boards of directors (or shareholder meetings depending on their specific charter provisions concerning the approval of major investment projects) may disapprove of a choice motivated by political considerations of host countries and imposed on oil companies. This would mean ceasing the development of the project in question (even if it be a temporary suspension of it) and bearing direct financial losses to the participants with all due implications as well as returning to the point of origin of a road partially walked in the development of the project.

All of the above shows that in line with economic considerations ensuing from the concept of "multiple routs of transportation" and taking into account the possibilities for resolving the problem of Black Sea straits, the main routes of transportation of Azerbaijani oil to Europe should lie through Novorossiisk and Supsa, at their maximum capacity, with simultaneous construction of the Burgas-Alexandropolis bypass pipeline connecting it to the supplies along both routes. In this situation, some of the Caspian oil flowing through Novorossiisk and Supsa would find its consumers in Central and eastern, rather than Western Europe, in the countries of the Black Sea region (where it can get through the terminals at the western coast of the Black Sea) thus preventing the possible excessive supply of Caspian oil to the Western European markets (compare Tables 5-1 and 5-4) and saving the markets from a price collapse. Therefore, the capacity of the bypass pipeline does not "have to" be equal to the total capacity of the Baku-Novorossiisk and Baku-Supsa pipelines.

As concerns the third (in terms of preference) route of transportation of Azerbaijani oil, the picture is also less evident than what is presented to the public by certain Western experts. The Transneft data show that the third best route – in the order of strictly economic preference is the route through Iran to the Kharg Island terminals with further transportation to Asia rather than Europe, as the Asian market capacity is many times higher than the expected incremental demand in Europe. It is quite clear that today this option is politically unacceptable both to US companies and the US Government. It is also quite evident that the existing political problems involved in any Iranian routes can hardly be overcome in a speedy manner. Choosing the routes to Novorossiisk and Supsa as the main routes, however, leaves enough time for either settling the political problems between the US and Iran or for becoming convinced that those problems do not have a long-term settlement, before taking any decisions on the construction of a third transportation route supplying Azerbaijani oil to the market. This will make it possible to provide a strictly economic ground for the choice between competing Baku-Ceyhan-Europe and Baku-Kharg-Asia routes.

In the light of the above, we should note two fundamental, in our opinion, "political" elements in reply to those potentially opposing the stated point of view:

(1) None of the routes of transportation of Caspian oil under discussion today is free of political risks: the Caspian region as such is a zone of high political risks, so these risks are intrinsic in any route of transportation from this region;

(2) In our view, the possibility of a relatively speedy and effective settlement of the US-Iranian political differences is quite realistic. First, as soon as the US business community becomes really interested, the US Congress and the US Administration may first alleviate and then reconsider their irreconcilable stance toward Iran by, say, first repealing (or adjusting) the 1995 US Administration orders banning any business contacts between US companies and Iran as well as the Act on Sanctions against Libya and Iran passed in 1996, which imposed sanctions against non-US companies making major investments in Iran's petroleum sector. Second, this proposition is backed by historical precedents: the political antagonism between the US and the USSR was no less irreconcilable than the current one between the US and Iran, which, however, did not prevent a dramatic decline in the US-USSR confrontationalism as soon as the top leadership of both countries displayed a political will toward finding a settlement of interstate relations. Therefore, the possible resolution of the problem in question, i.e. the removal of political obstacles on the way to pipeline routes through Iran, is to a great degree a question of political will in the US-Iranian relations. The economic grounds for resolving this issue are there – the example of development of the Southern Pars field showed amply that the niche opened up because of non-participation of US companies is successfully filled by Russian, European and Asian companies. The threat of US sanctions against them is not perceived as a significant obstacle to their involvement in such projects, so US companies stand to loose much more as a result of those sanctions, and the interest of US companies in potentially profitable Iranian projects may ultimately play a key role in removing the political barriers to Trans-Iranian routes of transportation of Caspian hydrocarbons.

Proceeding from understanding of the above considerations, influential US experts developing appropriate political recommendations to the US Government and the US Congress are beginning to shift to the conclusion on the need to reconsider US policy toward Iran. In particular, such conclusions and recommendations were made in the studies by the IPP of Rice University [9, 29], the same conclusions were aired by the participants in the April, 1998, IPP-hosted seminar on "Iran and its Strategic Role in the Persian Gulf who recommended to the US Congress and Government:

- To develop a more subtle and weighted approach to the relations with Iran;
- To take the initiative and actively pursue a direct dialogue with Iran;
- To narrow down the sanctions regime: a regime of multilateral sanctions against Iran affecting only military and dual-application technologies evidently and directly related to the production of weapons of mass destruction would be more effective than the current regime of comprehensive economic sanctions (and this, in our opinion, already opens up a way to a cooperation with Iran in the petroleum and related sectors);
- The US Administration should prepare with the leaders of the Congress a new legislation on the use of economic sanctions as a foreign policy tool. This legislation should contain clear-cut provisions envisaging an annual review of economic pros and contras of imposed sanctions for US companies (including sanctions against transit of drilling equipment which could accelerate the beginning of oil production in the Caspian) and annual re-approval of existing acts of legislation on specific sanctions;
- The US should demonstrate its desire to consider the question of building the main oil and gas pipeline from Baku through Iran to Turkey, provided there is a closing of positions in the US dialogue with Iran (at the same time, it is recommended that for security considerations and for

the fear of overloading the Strait of Ormuz the US should not support the project of pipelines from Azerbaijan and Kazakhstan through Iran to the Persian Gulf);

- The US Administration and Congress should let US energy companies start discussions on investments in the petroleum industry of Iran that may be made after the sanctions have been lifted. Such discussions would reduce the clear advantages of European and Russian companies in Iran today while acceleration the progress in the official US-Iranian dialogue [29, 30].

The fact that the US Congress has recently become quite liberal in applying the sanctions against potential energy exporters is noted also by the studies of the Royal Institute of Foreign Affairs in London [31]. All this opens up prospects for a practical discussion of pros and contras of Trans-Iranian routes both leading to Turkish Mediterranean ports and those orientated at supplies to Asia (both to the Kharg Island terminals in the Persian Gulf and those taking into consideration their possible extension in order to bypass the Straits of Ormuz to the Indian Ocean).

The situation is not as clear for Kazakh oil as it may seem at first glance, proceeding from data in Table 11 indicating that the tariff for its transportation westward along the CTC route is much lower than in both presented options of its delivery to Asia, which prompts a definitive conclusion on the priority of this direction and route of Kazakh oil supplies.

It is quite evident that the costs of transportation of oil from Kazakhstan to Northeast China through a pipeline will explain discarding this route (of the stated length to the specified part of China). This normally ends any discussions of the Chinese route.

Economic feasibility of transportation of Caspian oil to China through a pipeline may, however, be achievable in the case of implementation of different multilateral supply substitution schemes ("swap" deals) as well as (in direct supplies) by shortening the length of the "Chinese" pipe. The latter may be ensured, for example, by a sufficient and stable demand for oil in the Sinxian-Uigur Autonomous Region (SUAR) of China, as well as in the case of successful breakdown of Chinese pipeline construction into several smaller self-sustaining projects that would become consecutive stages in the construction of a longer "All-Chinese" pipeline.

The economic development of SUAR has run ahead of the capacities of the energy sector of this region in terms of meeting the demand for energy resources. There are gaps in energy supplies, which are the reason for the first pilot deliveries of Kazakh oil to the area via railroad (the first trainload was delivered in October 1997). It is estimated that oil production in SUAR will increase to 24 million tons by the year 2000 (it is now at the level of 15.4 million tons), while consumption will grow to 23 million tons (current level – 14 million tons). It would seem at first glance that both the current and the future levels of oil production in the region exceeds its consumption. Under the current rules, however, SUAR has to export 50 percent of the oil produced to other regions of the PRC, which results in shortages within the autonomous region itself. Besides, a downward review of estimated future production at the Tarim field, the biggest in SUAR, may result in a further growth of the deficit in the energy supplies to the region [32]. Therefore, in the absence of the needed infrastructure of oil supplies, the shortages of oil in SUAR may reach at least 10-12 million tons per annum within the next few years.

In this situation, one of the possible ways of effective organization of pipeline transportation of the Kazakh oil in the Eastern direction within the stated scenario may, for example, be found in a scheme of replacement of Kazakh oil supplies to China, within the framework of an agreement signed between Kazakhstan and the CNPC, by supplies of oil from Western Siberia.

In this case, the first stage of the project may require construction of a pipeline from Pavlodar to the Chinese border (700 km) through which they may start supplies of Russian oil from Western Siberia to Asia against Kazakhstan's obligations under its agreement with CNPC. The second stage could include construction of a new pipeline from Kumkol area (with a view to using the existing pipeline from Pavlodar to Kumkol in the future) westward toward the Zhanazhol group of fields and on to Tengiz, which would allow to tie this pipeline to the Uzen group of fields as well (in August 1997, the CNPC won the tender for setting up a joint venture with Uzenmunaigaz to develop this group of fields).

The above will let:

(a) Kazakhstan:

- Begin collecting payment for the transit of Russian oil to China relatively early;
- Use the revenue generated by the transit of Russian oil through Phase One pipeline as Kazakhstan's investment contribution under its agreement with the CNPC, i.e. as the Kazakh share of investment in the construction of Stage Two of the pipeline. This could in its turn result in a favorable redistribution of Kazakhstan's share in the agreement with the CNPC
- Provide the raw materials (at the cost of the Russian "substitution" supplies) in order to meet its obligations under the agreement with the CNPC) immediately (production from the Uzen group of fields alone will clearly be insufficient to fill the pipe to China)

(b) Russia:

- Alleviate the export load of the Western European market by decreasing the size of supplies in that direction by the size of the redirected supplies (and thus prop up the price situation in Western Europe);
- Gain an entryway to the potentially bigger Asian market through a relatively painless transition from one market to another;
- Free a niche at the Western European market for the Russian oil from Timan Pechora, any freedom of maneuver of which in terms of shifting from one market to another is extremely limited;
- Decrease the costs of delivery of West Siberian oil to the consumers (about $30 per ton and more as of today) by shortening the transportation leg, therefore increasing the cost-effectiveness of export operations with West Siberian crude;

(c) China:

- Start imports of crude from Kazakhstan at an earlier date;
- Reduce the required investments in the Kazakhstan project and the cost of borrowing;
- Gain access to a broader resource base than that provided by Uzen fields alone.

The probability of accomplishment of a second Asia-oriented pipeline route within the framework of the "Eastern" scenario, the Central Asian Pipeline (CAP), is today limited by political reasons, despite its quite acceptable economics. This route can be regarded as competing with the Iranian route of transportation of Azerbaijani oil (both pipelines target one and the same Asian market, and the transportation costs in both cases are practically the same – see Table 11) with three

advantages of CAP as compared to the Trans-Iranian pipeline to Kharg which we believe to be quite significant:

(1) CAP terminals on the coast of the Indian ocean near Pasni in Pakistan would resolve the problem of the Strait of Ormuz whereas the loading of crude onto tankers on Kharg Island located in the Persian gulf would require passage through this busiest marine shipping straits in the world with all the ensuing negative consequences: navigational, environmental, insurance, and the like;

(2) Carrying out of CAP does not impose any political limitations at the government level even today, although, undoubtedly the political risks related to the involvement of individual companies in the CAP project (suffice it to mention the perpetual hostilities in Afghanistan) may even exceed similar risks associated with their participation in Trans-Iranian pipeline;

(3) CAP is proposed for construction in the territories of states (Afghanistan and Pakistan) that are not major producers of liquid fuels, so the CAP countries – if the project is implemented – become purely transit territories interested in the stability of CAP operation and maximizing the volumes transported by it (their well-being will be tied to the income derived through transit fees. Iran, on the other hand, is one of the major oil exporters, and while the construction of a Trans-Iranian pipe would make it an oil-transit state, its well-being depends more on its own crude export revenue than on the transit fees. For this reason, in the absence of effective (responsible) mechanisms of setting fair transit prices (Iran does not have any experience of this kind) there is a danger that in the case of a worsening price situation at the liquid fuels market, the supplies of "other people's" oil may face certain obstacles (within the transit policies of the country) with a view to improving the competitive positions of Iran's own oil. There is, in our opinion, an effective antidote even for this well-grounded fear: it is necessary to involve Iran (as well as other Asian countries whose territories are considered as hosts for transit pipelines) in the work o the energy Charter Conference. Accession of Iran to the European Energy Charter, its signing and subsequent ratification of the Energy Charter Treaty would provide legal guarantees (with appropriate international compliance control and responsibility mechanisms ensuring far transit rules) to oil companies participating in the Trans-Iranian pipeline in the case that the latter is realized (more about energy transit in the light of the Energy Charter Treaty, see [33].

The CTC route also has some objective downsides that may worsen its economics. Let us note just two of them: the problem of Black Sea straits and the orientation at the Western European market.

The CTC route, like the Baku-Novorossiisk and Baku-Supsa routes, may avoid the negative consequences of the "straits" problem through construction and use of the Burgas-Alexandropolis bypass pipeline. This would increase the cost of transportation through the pipelines of this route from $25 to $34 per ton (for Stage 1 of the CTC), which would roughly equal the cost of transportation of Azerbaijani oil through pipelines leading to the Georgian and the Russian coasts of the Black Sea and using for its further transportation the selfsame line bypassing the Bosphorus and the Dardanelles. The Western European orientation is in itself a more serious problem for the CTC.

In using the CTC, Kazakhstan will inevitably face the problem of excessive supply at the Western European markets (see Table 5-1). It is exactly the construction of the CTC that will create the most downward pressure on Western European market prices, as it is designed to have the maximum "startup" capacity as compared to other pipelines targeting the same market (first, the

CTC is tied to the production levels of Tengiz, second, it makes the costs of transportation competitive). To maintain the most economic regime of transportation, it will have to be operated with the maximum possible load (about 85 percent), for potential damage of not complying with the economic regime of operation will also be maximum.

A similar effect will be created on the market by the construction of the Baku-Ceyhan pipeline, as in order to minimize the gap between its costs of transportation and the costs of transportation via alternative routes (that is not in favor of Baku-Ceyhan today), this pipeline should also be designed for maximum capacity. This is why we believe that economically those two pipelines should be in fierce competition with each other and, most probably, become mutually exclusive routes of supply of Caspian oil to the European market (i.e. the construction of one excludes construction of the other on economical grounds). The slower is the estimated production of Caspian oil, the fiercer will be the "shoot-to-kill" competition between the CTC and Baku0Ceyhan pipelines.

In the light of the above, one cannot exclude a situation where comparative economic advantages of the supplies of Kazakh oil to the Western European market (using the CTC with the Burgas-Alexandropolis bypass pipeline the estimated transportation costs to Genoa will total $34 per ton) may be negated by drastically improved, as compared to Table 11, economics of oil supplies to China (calculations needed) and acceptable economics of supplies through the CAP (about $50 per ton to the South East Asia coast) to a much more receptive market than Western Europe. The existing price bonus (additional profit of oil company) that may at first glance appear significant and that is derived from cheaper (by $15 per ton or $2 per barrel) transportation of Kazakh oil to Europe through the CTC as compared to the costs of Asian transportation routes may be set off completely by the negative price pressure (decrease of European prices by an equal or even bigger amount) created by the additional excessive supply at the Western European market as a result of massive supplies of Kazakh oil (the volume of CTC supplies during Phase One will equal half, and within Phase Two, two thirds of the estimated demand growth in Europe in the years in question – see Table 5-1).

Thus in the case of supplies to one market, the hierarchy of preference of Kazakh oil transportation routes would seem quite evident, proceeding from economic reasons. Being targeted, however, at different markets with substantially different current and future capacities, in determining whether the route in question is preferable, one should take into consideration the different price pressures created by the supply of the above amounts of Kazakh oil to those different (European and Asian) markets.

Therefore, within the framework of the "multiple routes" concept, the following routes of delivery of Kazakh oil may turn out to be feasible – from the economic standpoint:

- Using all three routes under consideration with the CTC, say, limited to its Phase One capacity;
- Using Asian routes only providing the delivery of all volumes exported by Kazakhstan to the more flexible and faster growing Asian market, especially to those segments (continental China) where deliveries of competing (e.g. Middle Eastern) crudes is difficult for objective reasons. This option has a number of other indisputable economic advantages, in particular, in that it envisages the use of schemes transforming the possible competition between Russian and Kazakh oils into cooperation.